

The Iron Age

INDEX TO
READING MATTER
PAGE 26

A Review of the Hardware, Iron and Metal Trades.

INDEX TO
ADVERTISEMENTS
PAGE 17

Published every Thursday Morning by DAVID WILLIAMS, Nos. 66 and 68 Duane Street, New York. Entered at the Post Office, New York, as Second-Class Matter.

Vol. XXXIX: No. 2.

New York, Thursday, January 13, 1887.

\$4.50 a Year, Including Postage.
Single Copies, Ten Cents.

A New High-Speed Electric Light Engine.

At a recent exhibition at Augsburg, Germany, the Maschinen Fabrik Oerlikon, of Zurich, Switzerland, showed in practical operation an electric light plant, driven by a compound high-speed engine of new and peculiar design. The engine was rated at 20 horse-power, and made 420 revolutions per minute, and while mounted only on an ordinary wooden floor without holding-down bolts or special foundation, is said to have given admirable results in point of smooth running.

The general features of the engine are shown in the engravings on this page, reproduced from *Der Praktische Maschinen-Constructeur*. It will be noticed that the high and low pressure cylinders are placed on opposite sides of the crank-shaft, their axes being almost in line. The cranks are arranged at an angle of 180°, and together with the connecting-rods are completely inclosed in the middle portion of the box frame. This is partially filled with oil, and lubrication is attained by submersion of the parts as in the Westinghouse engine. The valves are of the rotary type, and, in addition to their proper motion for steam admission and exhaust, are also given an end motion, so as to prevent unequal wear and leakage. The way in which this is attained will be understood from the general view. Altogether the engine embraces a number of interesting features and deserves attention.

Steam Boilers and their Settings.*

The matter considered by the author was the best and most economical plan of setting for water-works. He gave his reasons for thinking that the best form of boiler for water-works is the horizontal return tubular. Proceeding, he said any good setting suitable for water-works purposes is equally applicable for most any purpose where steam is required.

Let us suppose that we are to set a tubular boiler 60 inches diameter and 16 feet long, containing 44 4-inch tubes. The boiler will be furnished with a steam dome 30 inches diameter and 42 inches high, also a mud drum 20 inches diameter and 6 feet long. The mud drum is attached to the boiler by means of cast or wrought iron necks near rear end of boiler, and extends through the rear of the setting, where the feed and blow-off pipes are attached outside of the rear wall. The walls of the setting should be built upon stone foundations about 20 or 24 inches deep, and the foundation under each wall about 24 inches wide; these foundations are to be leveled or even with the ground, and from this level the brickwork starts. The foundation being laid in place, block-up the boiler in position, with the bottom of boiler 4 feet above the ground. The steam dome must be plumb crosswise, and the bottom of the boiler shell a trifle lower, say $\frac{1}{2}$ -inch, at the rear than at the fore end. We are now ready for the walls. The side walls are 12 inches, common brick, and one width ($4\frac{1}{2}$ inches) fire-brick, the fire-brick in the sides extending down to a line 4 inches below the grates. The side walls are carried up plumb until about 4 inches below the center of boiler, when the inside face is "racked in" toward the shell, touching it about 4 inches above the center of boiler; above this point the walls are built solid against the boiler, and tight up under the cast-iron lugs or brackets riveted to each side for supporting the boiler. The distance between the inside faces of the side walls is 8 inches more than the diameter of the boiler. As the front ends of the side walls are finished, the anchor bolts for holding the cast-iron front should be solidly built into the masonry. For this size boiler the hoods, or doorways through which the fuel is thrown, would be about 16 inches deep, the bottom line of which is formed by a cast-iron dead plate extending clear across the furnace, and containing a ledge bearing for the grate-bar ends. Between the doorways themselves and between the doorways and the side walls the spaces are to be filled in solid with fire-brick from the dead plate close up around the lower half of the boiler-shell end, the balance of the space at the end of the shell forming the front smoke-box being formed by common brick. A cast-iron plate is placed across the top of front smoke-box, which is provided with a nozzle suitable for receiving the chimney connection. The side walls above the supporting lugs on the shell are carried straight up 8 inches thick, and where a return flue over the top is not used the space between the walls is filled in with sand, or a brick arch covering the boiler is placed between the walls; the brick arch is much to be preferred, suitable provision being made for reaching the manhole in top of boiler.

The bridge wall should be about 20 inches thick, the upper face and that toward the furnace and above the grates being laid with fire-brick. A very good kind of bridge wall is made by carrying the wall right up to the boiler shell, with the exception of an opening in the central portion 36 inches wide,

the bottom of this opening, or what is the same thing, the top of the bridge wall, being 12 inches below the boiler shell. This arrangement tends to keep the flame close up to the shell, and directs it so that it does not have much tendency to leave the shell and dive down into the open space back of the bridge wall. The furnace should be about 5 $\frac{1}{2}$ feet wide and 4 $\frac{1}{2}$ feet long, the surface of the grates being in the neighborhood of 28 inches below the boiler. This grate surface of about 25 square feet will do for the average work, although it might have to be varied in shape, such as making it longer and narrower, or in area to accommodate some specific conditions of draft or fuel.

It is found to be very good practice to place an 8-inch bridge wall just at the rear

in number, placed vertically, one pair at each end of the side walls, and the other pair midway between them, with tie rods $\frac{3}{4}$ inches in diameter, extending across above and below the masonry. The dimensions and sizes given apply only to 60 inch 16-foot boilers, and for other sizes they vary accordingly. The author had little faith in the plan of admitting air back of the bridge-wall, or otherwise than through the grate bars or fire-door opening, for every-day regular business; the knowledge and skill required to keep most of these devices up to what they are intended for would yield better results applied directly to firing. He favored returning the products of combustion over the boiler; the flue for this purpose in a boiler of the dimensions considered

The Reminiscences of a Pioneer in the Hanging Rock Region.

A correspondent of the *Tribune* writes to that newspaper as follows:

In 1819 there went from Spartanburg, S. C., to Hanging Rock, on the Ohio side of the river, a certain man named John Means, carrying his slaves with him. He was an abolitionist, but not being able to manumit his slaves in his native State he sold his possessions there, and with his family and negroes emigrated to the nearest point where he could set them free. In 1826 John Means built a charcoal furnace near his home, and began the manufacture of pig iron. The Union—as he named it—was the

knows. In 1837 he leased the Union furnace of his father, and ever since he has been connected with it as lessee or owner. At first they made from 3 to 4 tons a day, and when they increased the output to 30 tons a week it was considered a wonderful performance. There are now three furnaces where Mr. Means began, known as the Pine Grove furnaces, but there were no new ones built in his vicinity until 1846, when one called the Ohio was put up which had a capacity of from 10 to 12 tons daily. Mr. Means enlarged the Union to the same size and soon after built at Pine Grove, and bought and operated a coal mine 3 miles distant. The ore used was a brown hematite, which yielded about 40 per cent. of iron. The ups and downs of the iron business between 1837 and 1845 were the most remarkable of any in the history of that industry in this country. Great depression in every kind of manufacturing was followed by a few years of buoyancy, and then the political pendulum swung backward all too soon and many a hopeful industry was destroyed and its enterprising owners ruined. Speaking of those days Mr. Means said: "When I leased Union corn sold for 12 $\frac{1}{2}$ cents a bushel, and wheat for from 24 to 26 cents. Wages for competent laborers were only \$10 a month. I made a trip to New Orleans and saw wheat sold there for a quarter of a dollar a bushel and corn on the cob at the same price per barrel. We used only maple sugar in those days and paid for the commonest molasses 32 cents a gallon. Our woolen goods were woven on hand looms. It took 6 yards of calico to make a dress and the material cost half a dollar a yard. There are more people in Ironton now than there were then in the county. We saw no gold, and little silver coin except small pieces. Our circulation was chiefly bills of State banks and those were continually breaking. From 1854 to 1861 I kept my furnaces going, but sold very little iron, only enough to keep me in ready money. Charcoal iron was then worth from \$10 to \$14 a ton. In 1863 I had an accumulated stock of 16,000 tons. Next year it advanced to \$40, which I thought a fine lift, but in 1864 it netted me \$80 a ton. For eight years before the war nearly all the furnace owners were in debt, but creditors did not distress them, for they were afraid of iron, the only asset they could get, and so they carried their customers the best they could, hoping all round for better times. We are all right and so is the country, if the fools will quit tariff meddling."

Such was the statement of this venerable gentleman who for more than 50 years was actively identified with the iron industry, first as his father's assistant and later as a large proprietor. During his active years he built six furnaces, in all of which he retains an interest. The changes wrought by protection may be seen in this district to great advantage. Instead of a few small charcoal furnaces there are now a great number, most of which were constructed during or immediately after the war. There are also great coke blast-furnaces, using in all 46 stacks, with an output when in full operation of 2995 tons of pig iron a day, or of 898,500 tons for 300 working days. To produce this they require 1,797,000 tons of ore and 1,123,000 tons coke, a quantity of fuel and ore that would require 24 trains of 20 cars each every day of the 300 to keep up their supply. This in addition to the ore requirements of the 40 or more charcoal furnaces of the district. Few of these coke-using furnaces are running to their full capacity, and, until recently, many of them were standing idle. Mr. John Means, a grandson of the pioneer iron-maker and president of the Ashland Coal and Iron Railway Company, explained the reasons for this stagnation. These were, in brief, the giving out of the local supply of high-grade hematite ores, the low price which iron has commanded for several years, and the cost of bringing coke and ore to the furnaces. They could not compete with Chattanooga, Birmingham and Pittsburgh in making high-grade pig. Latterly they have been using a peculiar soft ore found in this vicinity which makes an iron similar to Scotch pig and used for the same purposes. Formerly they bought the Marquette, Lake Superior, ore, but the cost of transportation is too great for its profitable employment, when prices are as low as they have been of late.

This gentleman and Mr. John Russell, president of the Norton Iron Works, state that all the iron men of the district were awaiting anxiously the extension of the Chatteroi Railroad to the coal beds of the Big Sandy and Southwestern Virginia, and to a junction with the narrow-gauge railroad that carries the Bessemer ores from Cranberry, N. C., to Johnson City, Tenn.

Metal is now being substituted in England for cardboard in bookbinding. This novelty is known as the "British Pellisfort" binding, and it consists in the use of thin sheet metal for covers. The metal is specially prepared, and the cover may be bent and straightened again without perceptible damage. It may, in fact, be safely subjected to such treatment as would destroy ordinary covers. The metal is covered with the leather usually employed in bookbinding, and the finished book presents no difference in appearance except in the greater thinness of the cover.

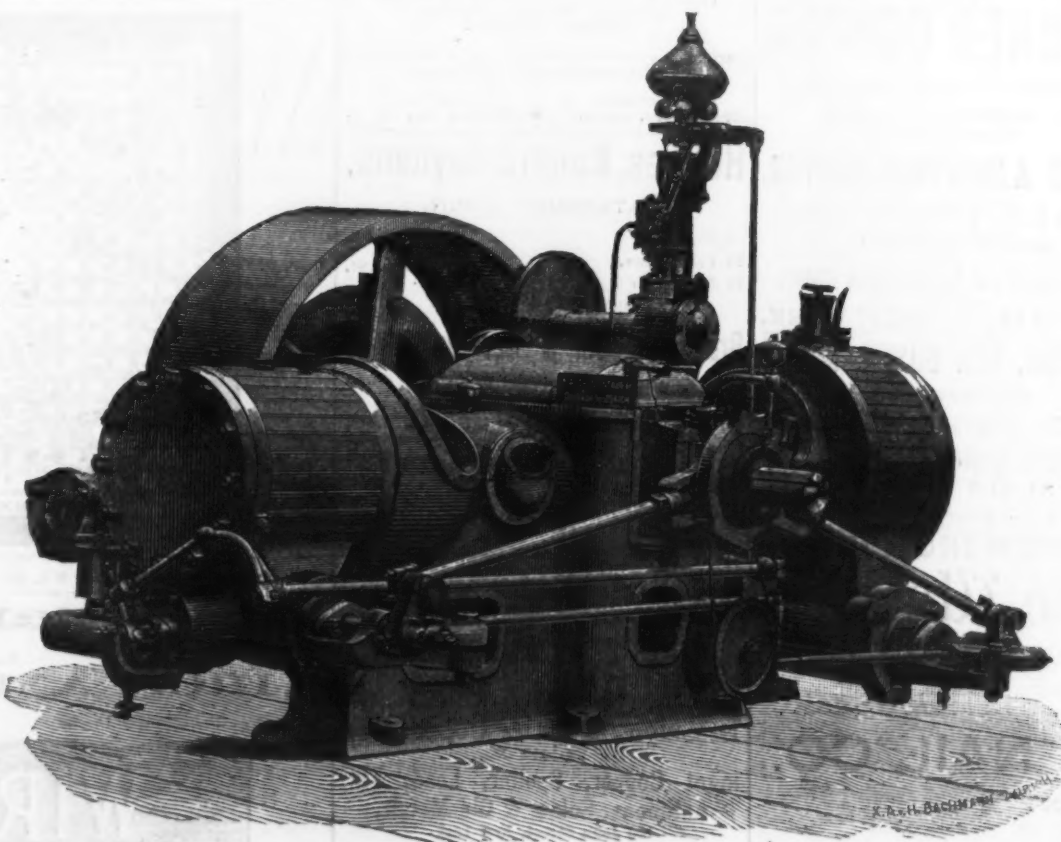


Fig. 1.—General View.

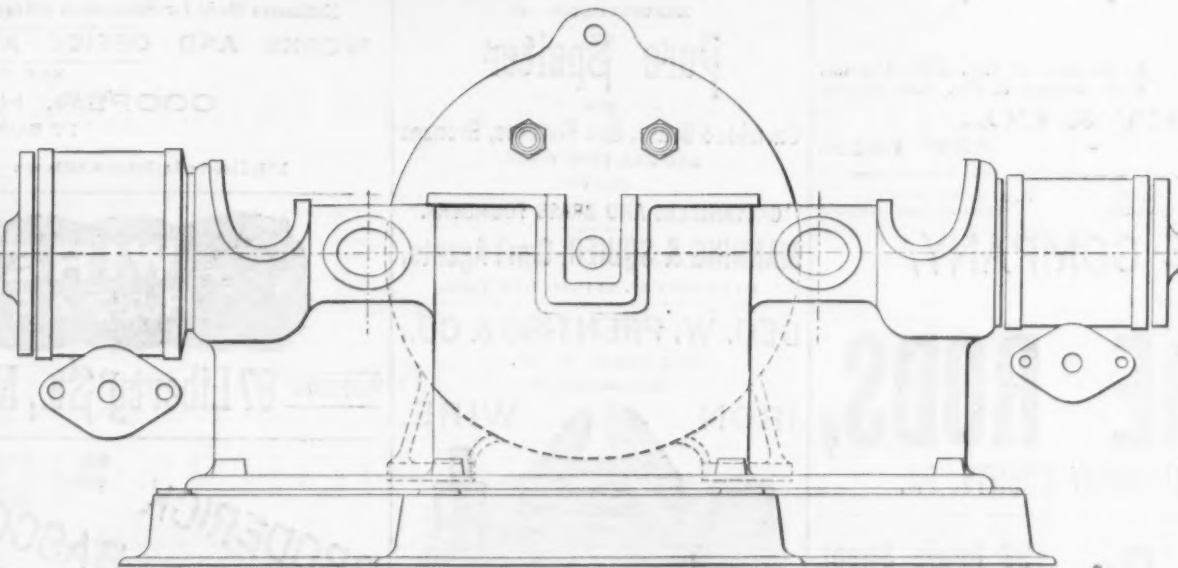


Fig. 2.—Elevation Showing Arrangement of Cylinders, Frame, &c.

A NEW FOREIGN HIGH-SPEED COMPOUND ENGINE FOR ELECTRIC LIGHTING.

end of the boiler, with its upper edge or face following around the curve of the shell and about 5 $\frac{1}{2}$ inches from it. This secondary bridge wall makes a sharp draft just at this point, and tends to hold the flame and gases well together in a solid sheet, keeping them close to the shell. The rear outer wall of the setting should be 12 inches thick, with an inner surface 18 inches from the end of the boiler. It is just a plain wall of common brick containing a cast-iron door through which to remove ashes; this wall extends upward 4 inches above the top row of tubes. A heavy iron plate thrown across from the boiler head to the wall forms the top of the rear smoke box. The end of the setting is closed in to the boiler by the 8-inch secondary bridge wall being carried in against the shell just below the water line, and then continued straight up to the height of the side walls. Sometimes instead of an iron plate forming the top of the rear smoke box, a half arch is thrown from the rear outer wall over against the rear boiler head; but the practical results are the same in both cases.

The boiler setting should be firmly bound together by means of heavy wall bars, six

should be 12 to 18 inches above the shell. He thought that there could not be heat enough over the boiler plates to injure them, as not more than 600° is admissible where water is in contact and the fire is the hot test.

In the discussion which followed it was held that the foundation and side wall were too light for most economical practice. It was recommended that the foundation be built solid throughout, extending at least 3 inches beyond the outside of the walls—both sides and ends—to prevent unequal settling. The side walls up to the fire-brick line should be at least 26 inches or three bricks thick above that; the outside or red-brick wall, 13 inches or a brick and a half, and the fire wall 9 inches, instead of 4 $\frac{1}{2}$, with a 4-inch air space between. Instead of "racking in" the side wall to the boiler it was preferred to close with tile made for that purpose. The "secondary bridge-wall" was objected to as having a tendency rather to check the draft and create a counter-current or eddy in the combustion chamber.

Until 1776 cotton spinning was performed by the hand-spinning wheel.

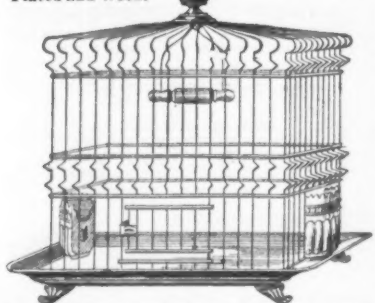
first iron furnace north of the Ohio in this district, in which there are now nearly three score, and, although built 4 miles from Hanging Rock, its product was known by that name, which eventually was extended to this entire iron region which lies in the three States of Kentucky, Ohio and West Virginia, and is fully 100 miles in diameter. Hanging Rock proper was the shipping point on the Ohio River then and for years afterward, and this doubtless was the chief reason for the adoption of that name.

In Ashland your correspondent met Mr. Thomas W. Means, a son of the pioneer furnace-builder. This gentleman, now 83 years old, has a vivid recollection of those early times, and of the hardships which all who made iron had to endure because of free-trade tendencies and laws. He speaks with enthusiasm of the prosperity that began when the Whigs got into power and restored protection, and with much earnestness he describes the disasters that followed the mischievous legislation of President Polk's period, and the long, hard struggle the iron men had until the first Republican Congress put protection into the tariff again. This venerable gentleman talks of what he

* Abstract of a paper read before the annual meeting of the American Water Works Association, Denver, Col., June, 1886, by Mr. Chas. A. Hague, M. E.

O. LINDEMANN & CO.
MANUFACTURERS OF
Japanned, Brass, Tin
Plated and Wood.

BIRD
CAGES.



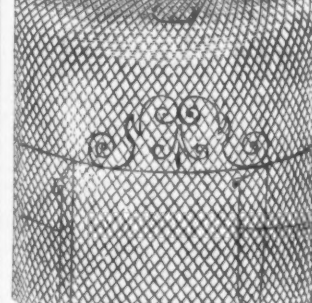
254 PEARL STREET, NEW YORK.

CARY & MOEN,
MANUFACTURERS
STEEL WIRE for all purposes and STEEL SPRINGS of every description.



Market Steel Wire, Crinoline Wire, Tempered and Covered.
Also PATENT TEMPERED STEEL FURNITURE SPRINGS, constantly on hand.
284, 286 and 288 West 29th Street, NEW YORK.

THE FRED. J. MYERS MFG. CO.,
COVINGTON, KY.



No. 7 Spark or Fire Guard.

Spark or Fire Guards,

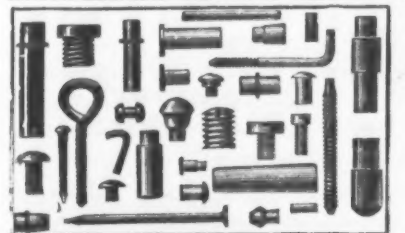
Nursery Fenders, Stove Guards and Wire Guards
of every description, made of Tinned,
Copper and Brass Wire.

Also a Full Line of Hardware Specialties.

SEND FOR
CATALOGUE
No. 18.



Square Corn Popper.



IRON AND BRASS RIVETS,
STUDS, PINS, SCREWS, &c.
For Manufacturers of Light Hardware.

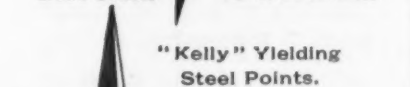
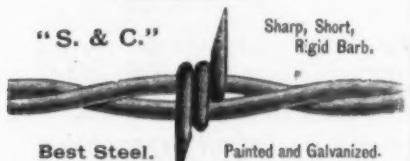
BLAKE & JOHNSON, WATERBURY, CONN.

W. S. TYLER
WIRE WORKS CO.
SUCCESSORS TO W. S. TYLER,
MANUFACTURERS OF

BRASS, STEEL AND
GALVANIZED WIRE,
FOUNDRY RIDDLES, COKE AND COAL
SCREENS.

W. S. TYLER, Pres. E. H. ALLEN, Sec. & Treas.
CLEVELAND, OHIO.

THORN WIRE HEDGE CO.
STEEL BARB WIRE FENCING.



Address THORN WIRE HEDGE CO., CHICAGO.

THE UNITED STATES

Mitis Company,
26 Broadway, New York.

This company is now prepared to issue licenses
or the use of the several Patents owned by them.
These Patents cover processes for the produc-
tion of "Mitis Castings" in Wrought Iron and
Steel, and improvements in furnaces for melting
and heating.

The Mitis Castings made in accordance with the
inventions covered by these Patents retain in
every respect all the valuable qualities of
the Wrought Iron and Steel (Scrap) from which
they are made, do not require annealing, can be
welded and worked under the hammer as well as
the raw materials.

Full particulars furnished on application.

W. F. DURFEE,
General Manager,
Room 67, 26 Broadway,
NEW YORK.

WIRE
TINNED,
MATTRESS,
BROOM,
LANTERN,
Steel Spring,
MARKET,
TACK,
STAPLE.

All Sizes
Straightened
AND CUT
TO ORDER.
CORRESPONDENCE
SOLICITED.

Palmer Wire Mfg. Co
PALMER, MASS.



E. T. BARNUM,
MANUFACTURER
WIRE AND
IRON WORK
Detroit, Mich.

The Popular Polish
of the world.
For sale by all dealers in U.S.A.
and Canada. Price List Free.
THE PARLOR MFG. CO.,
85 Fulton St., Boston.

All the Toe Calk Steel furnished by the
Gautier Steel Dept. of Cambria Iron Co.
will bear the following label on yellow
paper in black letters:

Gautier Steel Dept. of Cambria Iron Co. | Toe Steel. x
JOHNSTOWN, PA.

It is made from special soft stock, will
bend double without breaking, weld freely,
and harden sufficiently to cut glass.

Following sizes carried in stock for the
accommodation of our patrons:

Square Toe Calk in Stock,
3-8, 7-16, 1-2, 9-16, 5-8.

Flat Toe Calk in Stock,

3-8 x 1-4, 1-2, 5-8, 3-4, 7-8 x 7-16,
3-8, 7-16, 1-2, 5-8 x 5-16, 5-8, 3-4, 7-8, 1 x 1-2,
1-2, 5-8, 3-4, 7-8 x 3-8, 3-4, 7-8, 1 x 5-8.

This Steel is put up in bundles of 50 to
100 pounds.

New York Office,
104 READE ST.

Chicago Office,
202 First Nat. Bank Building.
[No. 146.]

Philadelphia Office,
523 ARCH ST.



Estab'd 1818. Incorp'd 1874.
THE
GILBERT & BENNETT MFG. CO.
WAREHOUSES:
42 Cliff St., New York.
225 Lake St., Chicago, Ill.
MANUFACTURERS OF
Iron & Galvanized Wire
Staves and Wire Cloth.
Power Loom Painted and Gal-
vanized Window Screen Wire
Cloth, Galvanized Wire Cloth
for Drying Fruits, World's Gal-
vanized Web Wire Fence, Gal-
vanized Twist Wire Fencing,
Factories, Georgetown, Conn.

LANE'S PATENT STEEL DOOR HANGER.

The most perfect Anti-Friction Hanger in the Market,
BECAUSE



It is made of steel throughout, except the wheel, which has a
steel axle. It will not break. It is practically free from wear. It
is almost noiseless in action. It requires no oil. It has a broad
bearing on the door, and keeps in line. It is by far the most
durable. It may be used with any track. It is always in order.

LANE'S PATENT TRACK

Is made of steel and is easily put in position. Catches and holds
so snow or ice. Door hung thereon cannot jump the track. Is not
subject to decay. Requires no fitting, but is ready at once. May
be used with hangers of other manufacture.

Manufactured by **LANE BROS.,** Poughkeepsie, N. Y.

JOHN H. GRAHAM & CO., General Agents, 113 Chambers Street, NEW YORK.

PHOSPHOR-BRONZE



"Phosphor-Bronze."

THE PHOSPHOR-BRONZE SMELTING CO., LTD.,

No. 512 Arch Street, PHILADELPHIA, PA.

Owners of the U. S. Phosphor-Bronze Patents. Sole Manufacturers of Phosphor-Bronze in the U. S.

Common Sense Screw Driver.



Silver Medal awarded at Novelty Exhibition, Philadelphia, 1885. This is a plain driver, with solid blade
and handle, has a sliding attachment that holds the screw firm to the driver, and when this is pushed back re-
leases the screw to drive home. Strong and well made of best steel. Sells at slight. Send for circular and prices
to the patentee, G. F. KOLB, 732 Sansom St., Philadelphia, Pa.

THE CELEBRATED
"SILVER FINISH"
GALVANIZED POULTRY NETTINGS.

FOR SALE BY THE HARDWARE TRADE.

GET THE BEST.

ROOF CRESTING,
Tower Ornaments, Vanes, and Stable Fittings.

FULL LINE OF EACH MANUFACTURED BY

National Wire & Iron Co., DETROIT, MICH.
Send for Catalogue, stating your wants. Liberal Discounts to the Trade.

THOMPSON McCOSH, President.

JOHN A. McCOSH, Sec. and Treas.



LIGHTEST, STRONGEST, BEST BARB WIRE IN EXISTENCE.



The above cut represents Preston's Patent Braided Cable Wire Fence Rail, manufactured by the
HOLLOW CABLE MFG. CO., Hornellsville, N. Y. We also manufacture extensively
four different sizes Wire Clothes Lines. Send for Circulars and Price Lists.

O. S. CHAMBERLAIN, 55 Dearborn St., Chicago, Ill.

THE BILLINGS & SPENCER CO. HARTFORD, CONN.

MANUFACTURERS OF
STANDARD MACHINE WRENCHES
SINGLE AND DOUBLE END
IN 16 SIZES.
DROP FORGED OF BAR STEEL
TAKING NUTS FOR 1/4 INCH
UP TO AND INCLUDING
NUTS FOR 1 1/4 INCH BOLTS
AND ALL DESCRIPTIONS OF STEEL AND IRON DROP FORGINGS.

WICKWIRE BROTHERS, CORTLAND, N. Y.,

MANUFACTURERS OF

WIRE CLOTH AND WIRE GOODS

"CORTLAND"
WINDOW
SCREEN
WIRE CLOTH.



Metallic Coal Sieve.

Dish Covers,
Corn Poppers,
Coal Sieves,
Flour Sieves,
Etc., Etc.

H. D. SMITH & CO.,

Plantville, Conn.,

MANUFACTURERS OF THE

BEST QUALITY CARRIAGE MAKERS' HARDWARE,

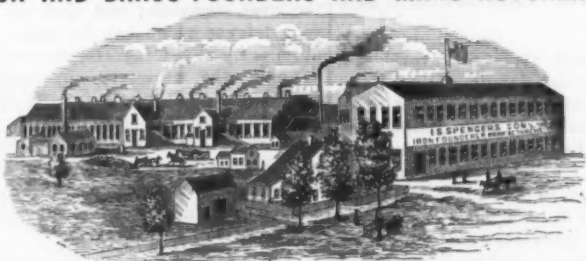
Manufacture the Largest Variety of Forged Carriage Irons, of Best Material and Workmanship.

PRICES LOW FOR QUALITY OF WORK FURNISHED.

SEND FOR PRICE LIST.

I. S. SPENCER'S SONS,
IRON AND BRASS FOUNDERS AND MANUFACTURERS.

Light and medium weight
GRAY IRON CASTINGS
of Best Material and Work-
manship a specialty.



Sound and smooth Brass, Bronze,
Composition and
Soft Metal Castings.

ESTABLISHED 1857.

All kinds of light machine work, patented articles, fancy and light hardware, and wood and metal patterns made from samples or drawings. Japanning and Nickel, Bronze, Brass and Copper Plating a specialty. Extra facilities for annealing. Full capacity, 12 tons per day. *Correspondence or Interview Solicited.*

GUILFORD, CONN.

ELECTRIC LIGHT.

BRUSH ELECTRIC CO.,
CLEVELAND, OHIO.

WESTERN ELECTRIC COMPANY,

227-251 So. Clinton St., Chicago. 70-78 Trinity Place, New York.

COMPLETE AND PERFECT ELECTRIC LIGHTING SYSTEM,

For Central Stations or Isolated Plants. All kinds of Electrical Apparatus and Supplies.

The Curtis Steam Trap.



Has automatic air discharge; has a differential opening, thus discharging all the water as fast as it comes. Is very accessible for cleaning, the valve being on the outside. Send for circular. Manufactured by the

CURTIS REGULATOR CO.,

61 Beverly St., BOSTON, MASS.
GENERAL AGENCIES: 100 Liberty St., New York.
60 N. 4th St., Philadelphia, Pa.; 108 Fifth Ave.,
CHGO, ILL. 210 So. 3rd St., Minneapolis 707 Market St.,
ST. LOUIS

Established 1830.

THE PLYMOUTH MILLS.

Rivets, Trunk Nails,
Tacks, Clout Nails,
Burr, Wire Nails
PLYMOUTH, MASS.

THE WESTINGHOUSE ELECTRIC COMPANY,

Manufacturers of ISOLATED INCANDESCENT PLANTS, AND CONTRACTORS
FOR CENTRAL STATIONS.

It is believed that the advantages of our system place us beyond competition.

Capital investing for dividends will do well to close no contracts till our proposals are considered.

The WESTINGHOUSE ELECTRIC COMPANY, Pittsburgh, Pa.

WESTINGHOUSE, CHURCH, KERR & CO.,

17 Cortlandt Street, New York, 98 Fourth Avenue, Pittsburgh, Pa.

Engineers and Contractors for Central Stations for Incandescent Lighting on the

WESTINGHOUSE ELECTRIC COMPANY'S SYSTEM.

Isolated Incandescent Plants, Steam Power Plants for Manufacturers,

Direct-Connected Centrifugal Pumping Machinery, Designers of Special Applications of Steam Power.

THE WESTINGHOUSE MACHINE COMPANY,

MANUFACTURERS OF

The Westinghouse Automatic Engine.

PRICES REDUCED.

THE CONDEMNATION OF OUR COMPETITORS IS THE MEASURE OF OUR SUCCESS.

THE "JUNIOR" AUTOMATIC ENGINE.

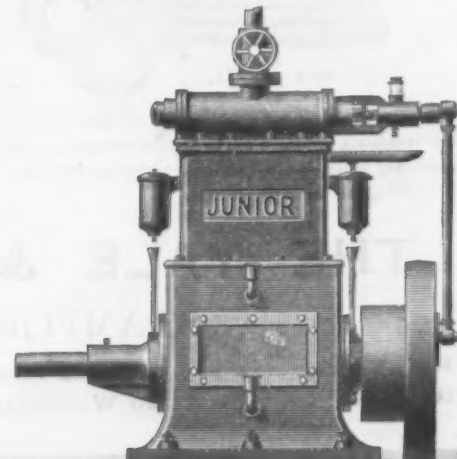
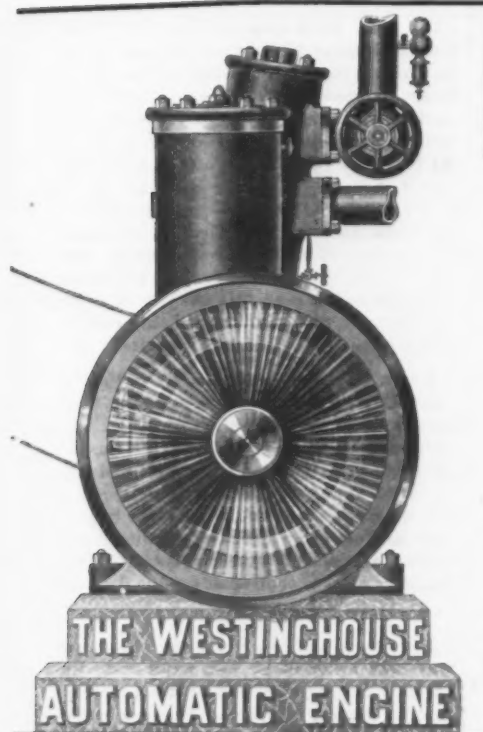
15, 25 and 35 H.-P. ONLY.

You will never know how cheap it is till you ask, nor how good it is till you try.

SALES DEPARTMENT FOR THE UNITED STATES CONDUCTED BY

WESTINGHOUSE, CHURCH, KERR & CO.,
17 Cortlandt St., New York. 98 Fourth Ave., Pitts-
burgh, Pa.
FAIRBANKS, MORSE & CO., Chicago, Ill.
FAIRBANKS & CO., St. Louis, Mo.
PARKE & LACY, San Francisco, Cal.

PARK & LACY & CO., Salt Lake, Utah.
D. A. POMPKINS & CO., Charlotte, N. C.
ROBERT MIDDLETON, Mobile, Ala.
H. DUDLEY COLEMAN, New Orleans, La.
KEATING IMPLEMENT AND MACHINE CO., Dallas,
Texas.



16 C. P. LAMP (A - 12c).

\$60 | AMERICAN GIANT DYNAMO | \$60

Electro-Plating and Electrotyping Machines

IN ALL SIZES, FROM \$60 UPWARDS.



**CHEAPEST
AND BEST IN
THE MARKET.**

Headquarters
for everything
in the Plating
and Polishing
Line.

**NICKEL
PLATING
AND
POLISHING
MATERIALS.**

ZUCKER & LEVETT CHEMICAL CO.,
ESTABLISHED 1863, INCORPORATED 1881.
SOLE MANUFACTURERS AND PATENTEES.

WORKS; 538 to 564 W. Tenth St. OFFICE: 36 to 40 Eleventh Ave., New York, U. S. A.

L. COES'
GENUINE IMPROVED
Knife Handle
PATENT
Screw Wrenches
MANUFACTURED BY
L. COES & CO.,
Worcester, Mass.
ESTABLISHED IN 1839.




Patented July 6, 1884. Patented July 6, 1884.
Registered March 21, 1874.

Sectional view illustrates our NEW KNIFE HANDLE, showing Malleable Iron Frame and Shank of Bar keyed into position.
Straight Bar, Extra LONG NUT FOR SCREW IN JAW.

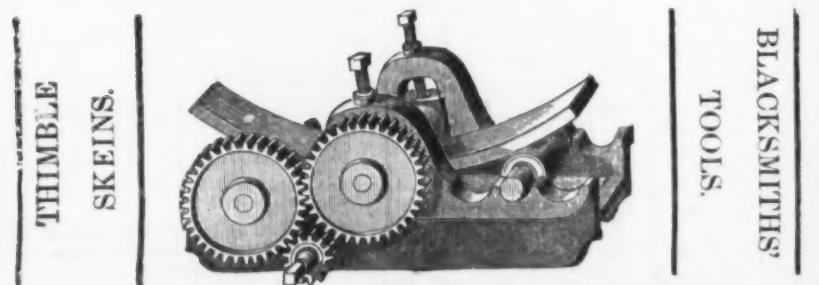
The Best Made and Strongest Wrench in the Market.
Send for Illustrated Price List and Circular.

J. C. McCARTY & CO.,
NEW YORK.
Sole Agents.

ILLINOIS IRON & BOLT CO.,

Nos. 20 to 26 Main Street,
CARPENTERSVILLE, KANE CO., ILL.

MANUFACTURERS OF



TIRE BENDER No. 3.

JACK SCREWS, SADIRONS,
COPYING PRESSES AND STANDS, &c.

American Manufacturing Company,
PHILADELPHIA,



MANUFACTURERS OF THE
ONLY PERFECT ADJUSTABLE
Sliding Door Hangers,

ONLY PERFECT
TRANSOM LIFTER,
ADJUSTABLE SAW VISES, SPOKE
SHAVES, SPOKE TRIMMERS,
BENCH HOOKS, HOLLOW AUGERS,
EXCELSIOR CAN OPENERS,

Patent Braided Cotton
CHALK LINES, &c.

FOR SALE BY
LLOYD & SUPPLEE
HARDWARE CO.,
PHILADELPHIA.



FLORENCE OIL STOVES

New York Office, 27 Union Square.

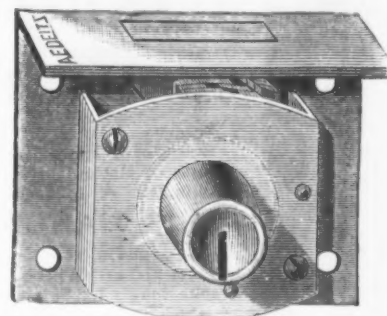
ORE JIGS.

The attention of Hematite ore miners is called to our new Jig. The simplest and most effective separator now in use.

McLANAHAN & STONE,
Sayport Foundry, Hollidaysburg, Pa.
Manufacturers of Ore Washers, Screens, Elevators, Conveyors, any general Ore Mining Machinery.

ARE LIKE FEW OTHER LUXURIES,
A NECESSITY AND ARE THE
BEST FOR ALL PURPOSES
FOR SALE EVERYWHERE MADE BY
FLORENCE MACHINE CO.
FLORENCE, MASS.

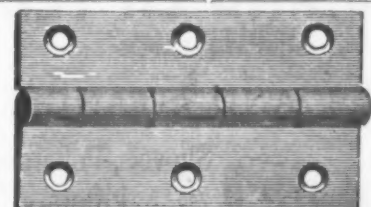
A. E. DEITZ. GOODSELL LATHE.



No. 51 Lock.

J. C. McCARTY & CO., Agents,
97 Chambers and 81 Reade Sts.,
NEW YORK.

Factory, BROOKLYN, E. D., N. Y.



W. & J. TIEBOUT,
MANUFACTURERS OF
BRASS, GALVANIZED & SHIP CHANDLERY
HARDWARE.
Nos. 16 & 18 Chambers Street,
NEW YORK.



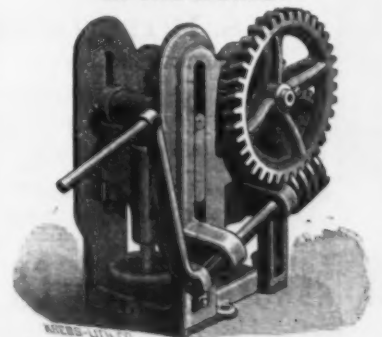
ALWAYS GIVES THE
UTMOST SATISFACTION.

Main Belting Co.
Manufacturers of
THE LEVIATHAN
COTTON

BELTING.
Unsurpassed for
Strength, Durability and
Cheapness.
Made to any Length,
Width and Strength.
Main Driving Belts.
Guaranteed to Run
Straight, Even Through
out.
No Cross Joints, Un-
affected by Damp
Clings well to the Pulley.
Has no equal. In fact,
is THE BELT.

MAIN BELTING
COMPANY,
S. W. cor. Ninth and Reed
Sts., Philadelphia.
Also
243 East Randolph St.,
CHICAGO.

The Strongest and Most Powerful
TIRE BENDER
IN THE WORLD.

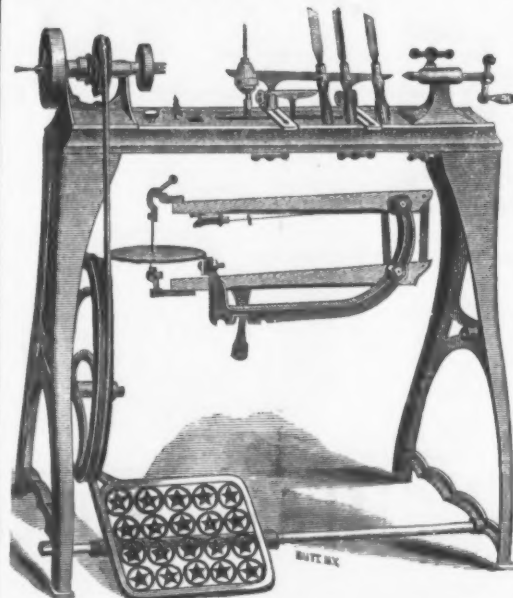


This is the only Tire Bender Geared with a Worm - the strongest and most powerful Tire Bender made, giving it a regular and easy motion, allowing no slipping of the tire or backward strain on the crank or operator. We guarantee it to bend from the smallest tire to 4 x 1 lb. with comparative ease. The tire is easily removed by drawing the centre roll straight out from the worm. The two end rolls are supplied with wrought-iron collars, in order to keep the tire from warping. The size of the tire is adjusted by a screw, enabling it to bend from a FIFTH WHEEL to the LARGEST TIRE. In workmanship it is fully up to the standard of our Celebrated Champion Blowers and Portable Forges.

Weight, 235 lbs.
THE CHAMPION BLOWER AND FORGE CO.,
LANCASTER, PA., U. S. A.



NOVELTY TOOL HOLDER
W. A. IVES & CO.
BRITISH PATENTS secured daily. Provisional protection (12 months), 45/-; to complete patent, £6, 10/-, including tax, drawings and all charges. Full patent taken at first, £8, 10/-. No extras. Write for circular. Patents sold or licensed. S. S. BROMHEAD, C. E., Mem. Soc. Arts, Patent and Registration Agent, 97 Newgate Street, London, England.



Many kinds of Scroll Saws have been put on the market by our selves and other manufacturers during the past twelve years. Of these only a few have proved good enough to remain in demand. The call now is for a well-made, practical machine, and all second-class ones are of slow sale.

Those who want a good Lathe with a scroll-sawing Attachment and all Tools and Improvements to the very latest moment will buy the Goodsell Lathe.

Those who want only a Scroll Saw with Drilling Attachment, Rubber Blower and Lever Clamp will prefer the Rogers Saw.

These two machines are taking the place of all others and are now the most in demand throughout the world.

No dealer can make a mistake by laying in a stock of them. About Christmas time they are wanted in every town, and will make business lively at this otherwise dull season.

We also keep a full stock of Designs, Wood, and all other Scroll Sawing goods.

Price of Goodsell Lathe complete, \$12.00.

Price of Rogers' Saw complete, \$3.50.

MILLERS FALLS CO.,

74 Chambers Street, New York.

CHAMPLAIN
Forged Horse Nails.
MANUFACTURED BY THE
NATIONAL HORSE NAIL CO.,
Vergennes, Vermont.
HOT FORGED AND COLD HAMMERED POINTED. MADE OF BEST
NORWAY IRON AND WARRANTED.
WAREHOUSE
97 CHAMBERS AND 81 READE STREETS NEW YORK.
J. C. McCARTY & CO. Sole Agents.

H. B. SEIDEL, President. W. HASTINGS, Vice-Pres. and Gen'l Mgr. E. T. CANBY, Sec. and Treas.

THE SEIDEL & HASTINGS CO.,

WILMINGTON, DELAWARE,

New York Office, No. 221 Pearl, Corner Platt Street,
MANUFACTURERS OF

BEST CHARCOAL BOILER PLATES, AND PLATE IRON GENERALLY.

ALSO BEST QUALITY HOMOGENEOUS STEEL PLATES.

We ask the special attention of the trade to our C. H. No. 1 Boiler Plates, which we manufacture expressly for the Shells of Steam Boilers and stamp 50,000 pounds T. S. when desired. One hundred and sixteen tests of this iron, made during the last three years by the U. S. Inspectors of Steam Vessels, show an average tensile strength of 56,808 pounds to the sectional square inch, and an average reduction of area of the fractured section of 30% per centum. Our prices are as low as the production of a good article will admit of.

POTTSVILLE IRON & STEEL CO.,

POTTSVILLE, PA., Manufacturers of all kinds of

STRUCTURAL STEEL AND IRON

Viz., BEAMS, CHANNELS, TEES, ANGLES, PLATES AND BARS; Also STEEL AND IRON AXLES FOR FREIGHT AND PASSENGER CARS.

This Steel is manufactured by the CLAPP-GRIFFITHS process, and is specially adapted, in addition to the above, for Boiler and Bridge Rivets, Wire Rods, Nail Plates, &c. &c. Our Mild Steel is well adapted for use in place of the best quality of Wrought Iron; where a greater strength and ductility is required, it welds readily as Iron. Also Billets, Slabs of all sizes and any desired temper. Shaping of all sizes in stock, from which prompt shipments can be made.

Brewery, Malt and Ice House Construction a Specialty.

Hermann-Parker Hardware Mfg. Co.,

MANUFACTURERS OF

GREY IRON SHELF HARDWARE.

Our Specialties: Axle Pulleys, Well Wheels, Grindstone Fixtures, Hay-fork Pulleys, Wash-boiler Handles, Store Lifters and Post Mauls.

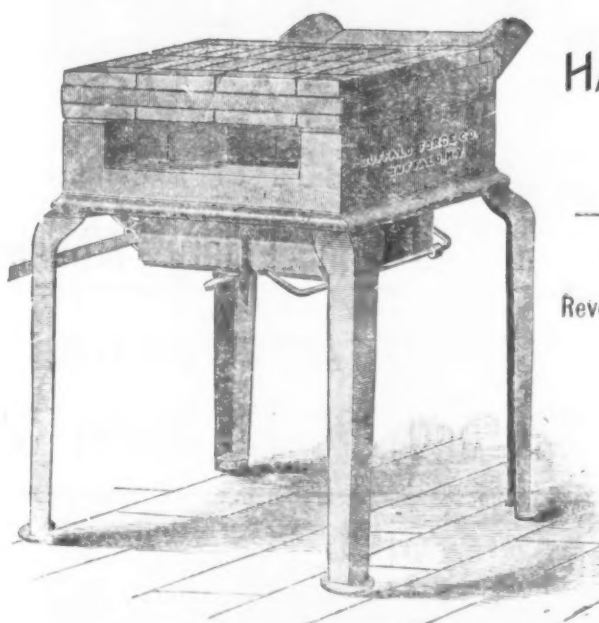
Works: 11th and Papin and 12th and Gratiot Streets, St. Louis.

PURE TURKISH EMERY.

WALPOLE EMERY MILLS,

South Walpole, Mass.

BUFFALO HEATING FORGES



FOR
HARD COAL
OR
COKE.

COMPLETE WITH
Revolving Shaker Grates
AND
Blast Gate.

MADE IN
Ten Sizes
AND
Styles
FOR ALL CLASSES OF WORK.

BUFFALO FORGE COMPANY,

BUFFALO, N. Y.



PENFIELD BLOCK CO., Lockport, N. Y.

Manufacturers of the West Patent Lock and Metal Plug Wooden Faucets.

Made of the best material. Compressed Leather Lined. Composition Spigots (Non-Corrosive). During years of practical use the West Lock Faucet has received universal commendation from the trade as being the best Lock Faucet in the market. All Faucets packed in barrels unless otherwise ordered. When packed in boxes we charge extra to cover cost of boxes. WRITE FOR PRICE LIST AND DISCOUNTS. HENRY B. NEWHALL CO., Agents, 105 Chambers St., New York.

HERO FRUIT JAR COMPANY,

— MANUFACTURERS OF —

Chace's Patent Machine, Sewing Machine, Paragon, Automatic, Engineers', Dripping and Bicycle

OILERS,

Oil Spouts, Sprinkler Heads, Engineers' Sets, Can, Coffee and Bottle, Flask and Shipping Can Screws, and all other Regular and Special Goods in *Spun or Stamped Ware*.

All kinds of **SHEET METAL GOODS** made to order.

We have the largest and best facilities for furnishing the best quality of work and promptly.

Correspondence solicited. Write for Catalogue.

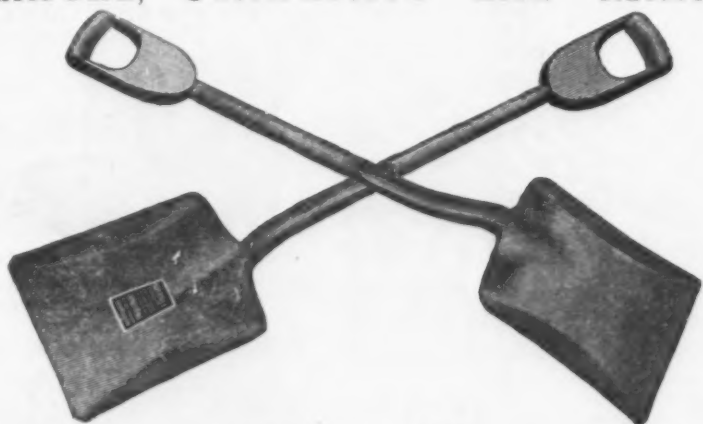
Office and Factories: GAUL and ADAMS STS., PHILADELPHIA.

HUSSEY, BINNS & CO., LIMITED,

Pittsburgh, Pa.,

MAKE A SPECIALTY OF

Railroad, Contractors' and Miners'



ALSO A FULL LINE OF

SHOVELS, SPADES and SCOOPS

FOR THE

HARDWARE TRADE.

COMMON SENSE POST HOLE DIGGERS.
COLD CHISELS, PUNCHES.

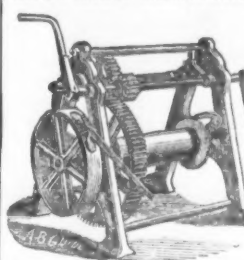
WOOD,
COAL
and
STONE

WEDGES.

Prices quoted on application.

J. C. McCARTY & CO., Direct Representatives,
97 CHAMBERS ST., NEW YORK.

CAST IRON HOISTING CRAB WINCH,



SINGLE
AND
DOUBLE PURCHASE
AND
SIZES FROM
1-2 TON TO
24 TONS.

Tangye's Patent Hydraulic Lifting Jacks.



REDUCED LIST.
6 TONS \$50.00
10 " 65.00
15 " 80.00
25 " 105.00
30 " 125.00

Also Hydraulic Punching Bears, Rail Benders, Girder Testers, &c.

McCOY & SANDERS,
26 Warren Street, N. Y.

OHIO CLIP WORKS,
Westville, Ohio,

Sole Manufacturers of the
"BAKER" CLIP,
For Singletrees, Heavy Axles etc. "Baker" Lap Links, "Baker" Oval Lap Rings, Ferrules and Hooks, Neck Yoke Irons, etc. Best Goods Made, Ask for them where you buy your Hardware, or send for Prices &c.



THE LIVINGSTON HORSE NAIL CO.,

104 Reade Street, NEW YORK.

AGENTS FOR

J. B. SAVAGE'S

PATENT FORGED

OX SHOES.

The Best Ox Shoe in Market. All Sizes.

SOLID STEEL BLADES.



Adjustable HANDLES.

Pat. Sept. 8, 1885.

WHEELER, MADDEN & CLEMSON MFG. CO.,

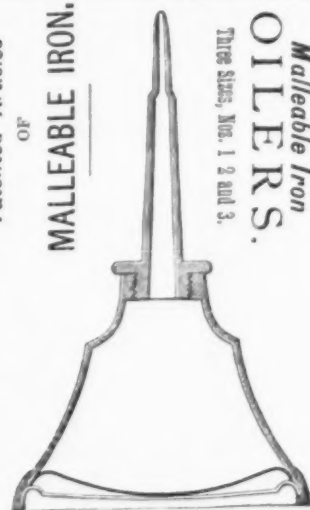
Middletown, N. Y.

VIRGINIA NAIL AND IRON WORKS COMPANY,

LYNCHBURGH, VIRGINIA.

NAILS and Bar Iron of Superior Finish, made exclusively from Pig Iron.

Patented Articles
OF
MALLEABLE IRON.



New Improved
PATENT
Malleable Iron
OILERS.
Three Sizes, Nos. 1, 2 and 3.

Hammer's Adjustable Clamps.
Mail. Iron Hand Lamps.
M. I. Hanging Lamps.

New Pattern Heavy Screw Clamps.
Strongest in the market.

For Sale by all the Principal Hardware Dealers.
SEND FOR PRICE LIST.
MALLEABLE IRON CASTINGS
of superior quality, and Hardware Specialties
in Malleable Iron, made to order.

HAMMER & CO., Branford, Conn.

EUREKA SHOW CASE CO.,

JOS. MONK, Manager,
208 and 210 Lake St., Chicago.

Buy direct from us and save commissions.
Write for Price List.



WOOD-ENGRAVING
ELECTROTYPING
PRINTED SUPPLIES

Manufacturers'
Wood Engraving,
Electrotyping
and Printing.
Publisher of THE MANUFACTURERS' EXCHANGE.

A. MUGFORD, Hartford, Conn.

The T. H. Bullock
BELLOWS The Best for the Money.
Cleveland, Ohio. FORGES

DOG COLLARS, HARNESS, LOCKS, LEADERS, COUPLINGS, and Everything Pertaining to the Dog.

Send for Illustrated Catalogue. We are the only exclusive manufacturers of these goods in the world.



MEDFORD FANCY GOODS CO.,

707 Broadway, New York.

J. BREMER, Prest.

JOHN E. HICKS, Secy.

Borthwick's Patent Rotary Saw Set.



EXAMINE THE PRINCIPLE, as illustrated in cut. NOTICE ROTARY ACTION, by which a perfect set is assured without danger of breaking teeth. For Price List and Terms address

BORTHWICK SAW SET CO., 337 Market St., Philadelphia, Pa.

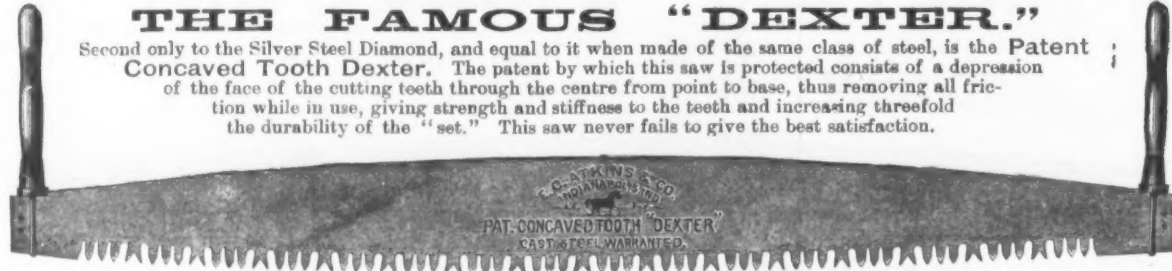
• E. MERRITT & CO. •
ESTABLISHED 1859 — BROCKTON, MASS.
The Only Manufacturers of a Complete Line of
TACK AND NAIL MACHINERY.
SEND FOR CIRCULAR — UPRIGHT DRILLS.



E. C. Atkins & Co., Indianapolis, Indiana.

THE FAMOUS "DEXTER."

Second only to the Silver Steel Diamond, and equal to it when made of the same class of steel, is the Patent Concave Tooth Dexter. The patent by which this saw is protected consists of a depression of the face of the cutting teeth through the centre from point to base, thus removing all friction while in use, giving strength and stiffness to the teeth and increasing threefold the durability of the "set." This saw never fails to give the best satisfaction.



Ground substantially uniform gauge on the toothed edge, and any gauge required on the back.

ATKINS' Cross-Cut, Circular, Band and Gang SAWS Are Everywhere Recognized as the Standard of Excellence.

WESTERN AGENCY FOR Tanite Emery Wheels.

THE ILLINOIS WIRE NAIL CO., CHICAGO, MANUFACTURERS, 224 and 226 No. Union St.



HUNTER SIFTER.

ABREAST THE TIMES!

It is our pleasure to announce to the trade and our friends generally that, commencing with the twenty-fifth day of July, 1886, the

WORLD FAMED "HUNTER'S" SIFTERS

Will be Put upon the Market in a New Form.

Each and every Sifter will be separately WRAPPED in TISSUE PAPER, have the label EMBOSSED on instead of paste d RUN PERFECTLY, and come out of the box CLEAN and BRIGHT as a new dollar, a handsome, perfect and saleable article.

This is our original idea, and WE WANT TO SEE WHO WILL BE THE FIRST TO "STEAL OUR THUNDER" this time. Heretofore every sifter, however poor or cheap (and most of them were dear at any price), has copied our LABEL, STYLE, TRADEMARK and ADVERTISEMENTS word for word, but we still live! There will be no advance in price. Dealers, "Don't be Clams," but order the new goods in advance, as we anticipate a rush. Get CLEAN, NICE goods and please your customers.

THE HUNTER SIFTER MFG. CO.,

Court Broadway and Eggleston Ave.

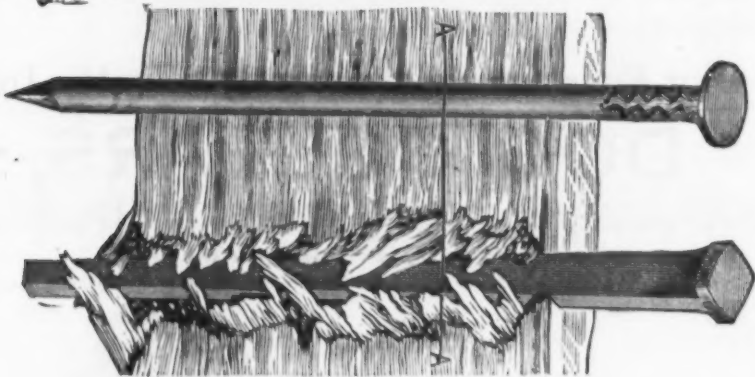
CINCINNATI.

THE SALEM WIRE NAIL CO.,

SALEM, OHIO,

—MANUFACTURERS OF—

WIRE and WIRE NAILS.



AGENTS:

ELY & WILLIAMS,
New York
and
Philadelphia, Pa.

F. K. BOWES,
Chicago, Ill.
JNO. H. HEIMBUCHER,
St. Louis, Mo.

N. U. WALKER CLAY MFG. CO.,
Pittsburgh, Pa.



THIS VALVE

is expanded by winding a strip of leather around the link under the rubber. The link and rubber are so constructed that the packing cannot get out.

A. WYCKOFF & SON,

ELMIRA, N. Y.

PATENT RUBBER VALVE FOR CHAIN PUMPS.

The BEST and Most Durable Expanding Valve on the Market.

Write for Sample and Prices.

HUGONIN IMPROVED ADJUSTABLE SCREW SASH BALANCES.

widths: 1 1/2 in., 1 3/4 in. and 2 in. of Malleable and Gray Iron. All Genuine Hugonin Improved Balances have Robt. B. Hugonin Patentee and Solely Authorized Maker cast directly upon them, and by which they are instantly known. Beware of Imitations: sold by misrepresentations. Buy only the Genuine, which are made under the care of the inventor. Send for reduced prices from Jan. 1, '87. Address, THE ROBERT B. HUGONIN WINDOW FIXTURE MFG. CO., HARTFORD, CONN.



Exact Size No. 3.

Quality Superior.

UDELL WOODEN-WARE WORKS,

INDIANAPOLIS, IND.

NEW YORK ADDRESS:
32 CORTLANDT STREET,
Manufacturers of
Rope Reels, Broom Stands,
Step Ladders, Extension Ladders,
Long Ladders, Clothes Bars, &c.

Largest line of Step Ladders in the World. Send for Catalogue.



JESSE JONES & CO.
No. 615 COMMERCE ST.
PHILADELPHIA, Pa.
SHELF BOXES
MADE OF WOOD WITHOUT NAILS OR SCREWS.
SEND FOR CATALOGUE.
PAPER BOXES ALL KINDS FOR HARDWARE.

A TAKING NOVELTY. "Beacon Hill" MOUSE TRAP



Always Baited. Sure to Catch.

SEND 10 CENTS FOR SAMPLE.

RIPLEY MFG. CO.,
UNIONVILLE, CONN., U. S. A.

The HANDLES and EDGES cannot be TURNED off from the Dussieux Pat. "All Steel" Screw Drivers.

Neither can you get a BETTER TOOL at any price. Get our Catalogue. Screw Drivers, Fly Screens, Egg Beaters, &c.

PAINE, DIEHL & CO., 12 Bank Street PHILADELPHIA, PA.

1/2 Pair Chicago Double-Acting Spring Butts.
LIST JAPANNED.
In. per pair. \$1.20
1 1/2 " " " 2.50
2 " " " 5.00
2 1/2 " " " 8.00
3 " " " 12.00

CHICAGO DOUBLE-ACTING SPRING BUTTS.
MANUFACTURED BY THE
CHICAGO SPRING BUTT CO.,
In Japan, Michell or Bruce Plated and Red Bronze and Brass.
The BEST SPLITTING BUTTS ON THE MARKET. Specially Adapted for LOCKS, WHEELS, OPERATING VALVES, and for New Invented Catalogue and Prices.
OFFICE:
137 Clark St., Chicago, Ill.
Patented May 14, 1886.

Nock's Improved PAD LOCKS



PENN LOCK WORKS, 142 N. 4th St., Phila.

AXLEINE

is a fine quality of Axle Grease, put up in square tin boxes containing one pound, beautifully decorated in assorted colors, designed especially for the Hardware Trade. Showy and attractive shelf goods. Send or sample and prices.

LOVELL, TRACY & CO., 71 Asylum St., Hartford, Conn.



one-tenth the cost. Can be applied with a screw-driver by any handy person.

STATE AGENTS WANTED.

Manufactured by

J. R. CLANCY, Syracuse, N. Y.



P. F. BURKE,

Successor to C. F. Dewick & Co.,

Manufacturer of

PATENT STEEL

Toe Calks,

860 Dorchester Avenue, Boston, Mass.

For Net Bottom Prices see Page Adv. Iron Age, AUGUST 5th.

BROUGHTON'S
BURGLAR-PROOF SASH LOCKS.
Patented Oct. 2, 1876.
FOR NET BOTTOM PRICES SEE PAGE AD.
IN IRON AGE, AUGUST 5th.



No. 210. Ornamental Iron, Iron Knob, fine finish, Etiracan Bronze..... \$0.60
No. 211. Ornamental Iron, Iron Knob, fine finish, Olympian Bronze..... .75
No. 212. Ornamental Iron, Iron Knob, fine finish, Pompeii Bronze..... .85
No. 213. Ornamental Iron, Iron Knob, Nickel-plated, Copper Old Gold Inlaid..... 1.25
No. 214. Ornamental Iron, Iron Knob, Nickel-plated, Lemon Old Gold Inlaid..... 1.50
No. 215. Ornamental Iron, Iron Knob, Nickel-plated, Pale Old Gold Inlaid..... 1.60
No. 216. Ornamental Iron, Iron Knob, Nickel-plated, Fire Old Gold Inlaid..... 1.75

No. 21. Ornamental Iron, Iron Knob, Nickel-plated, Crimson Old Gold Inlaid..... 1.85
No. 218. Ornamental Iron, Iron Knob, Nickel-plated, Blue Old Gold Inlaid..... 1.90
No. 219. Ornamental Iron, Iron Knob, Nickel-plated, Green Old Gold Inlaid..... 1.95
No. 220. Ornamental Iron, Iron Knob, Nickel-plated, Copper Old Gold Inlaid..... 2.00
No. 221. Ornamental Iron, Iron Knob, Nickel-plated, Lemon Old Gold Inlaid..... 2.05
No. 222. Ornamental Cast Brass, Polished and Lacquered..... 2.65
No. 223. Ornamental Cast Brass, Nickel-plated..... 3.50

MANHATTAN HARDWARE CO.,
READING, PA., U. S. A.,
MANUFACTURERS OF
LOCKS of Every Description,
AND A FULL LINE OF
GENERAL BUILDERS' HARDWARE.

Special net prices to be found in *Iron Age* whenever changes occur.
The only manufacturers in the United States who quote bottom prices to all dealers without favoring any class.
Fine Gray Iron Castings of every description, also Real Bronze and Brass Castings, made to order very low prices; Pattern Making, Japanning, Bronzing, Tinning, &c.
Our goods are known and liked wherever sold.
Orders received will be filled at last prices quoted in *The Iron Age*.
We do no underhand business, but quote alike to all for quantities less than \$1000.
Our terms are strictly 15 days, f. o. b. Reading, no charge for cases or cartage.

THE
Charles Parker Co.,
Meriden, Conn.,
Manufacturers of
Cabinet Locks.

THE
ARC SCALES.
FOR POPULAR USE.

The "Little Wonder."
The "Postage Rate."
The "Home Friend."
The "Everlasting"
The "Plantation," and
The "Double Index Counter."

NO SPRINGS.
No Detached Weights.
Discounts to the Trade.

A "LITTLE WONDER" Scale sent by mail to any address on receipt of 75 cents, or a "POSTAGE RATE" for \$1.25, or a "HOME FRIEND" for \$1.50.

ARC SCALE MFG. CO., DAVENPORT, IOWA.

POST'S EUREKA SAP SPOUTS.
The Sugar Makers' First Choice.
11,000,000 Sold to Replace Various Other Kinds.
Twenty-Five Per Cent. More Sugar and a Better Quality than from any others, is the verdict of over 20,000 Maple Sugar Makers who use them. Their perfect working with satisfaction is guaranteed.

Agents wanted in every Maple Sugar Town. Descriptive Circulars, with Price Lists and Sample Spouts, sent free to the U. S. trade. Owing to the unusually heavy orders at this season of the year, it is necessary that all Agents (and those desiring agencies) forward their orders for the coming sugar season as early as possible, to give the required time for supplying all demands, and that shipments by freight can be made to as to reach their destination in due season. In ordering state distinctly whether to ship by freight or by express. Write immediately for Agency to

C. C. POST, Patentee, Burlington, Vt.

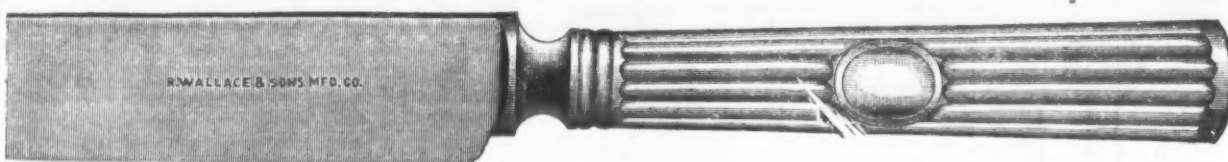
Late improvements all Patented.

SELL
Eurekas
ONLY; THEN YOU AND YOUR CUSTOMERS ARE MADE HAPPY.

THE CHAMPION.

BOILERS
W.B. POLLOCK & CO.
MAHONING BOILER WORKS
ESTABLISHED 1863.
PIPES, STACKS, BEAMS, ROOF TRUSSES,
BLAST FURNACES & ROLLING MILL WORK.
YOUNGSTOWN, OHIO.

THE NEW GIANT DRILL CHUCK.
Holds a Drill With the Grip of a Giant. All Steel.
Parts interchangeable.
SIMPLE IN CONSTRUCTION.
EASY TO TAKE APART AND CLEAN. BEST OF WORKMANSHIP AND VERY CHEAP. Manufactured and sold by
THE SMITH & EGGE MFG. CO., Bridgeport, Conn.

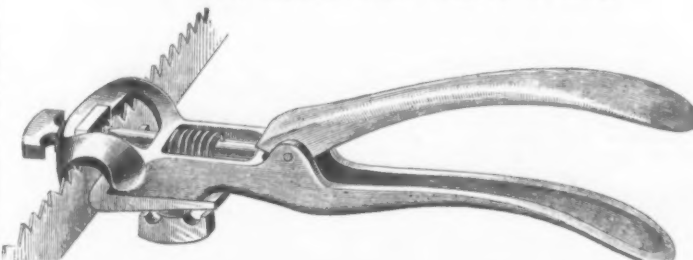


The above cut represents one design of our new Hollow Handle Knife, either silver or nickel silver handles, made of a seamless drawn tube. This handle is not soldered, as is the usual method, and yet has the taper and form necessary to produce the most durable and tasteful article of its kind ever shown. Knives can be furnished either plain or ornamented handles.

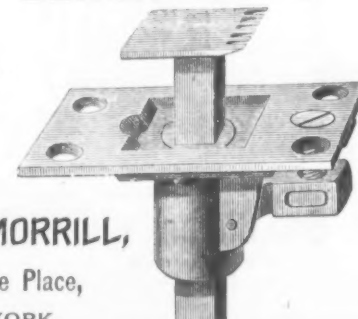
R. WALLACE & SONS MANUFACTURING COMPANY,
MANUFACTURERS OF SOLID SILVER WARE GUARANTEED $\frac{1}{1000}$ FINE. ALSO NICKEL SILVER HOTEL AND TABLE WARE,
Factories, WALLINGFORD, CONN. New York House, 21 PARK PLACE.

MORRILL'S PERFECT SAW SETS AND BENCH STOP.

FOR SETTING EVERY VARIETY OF SAWS.

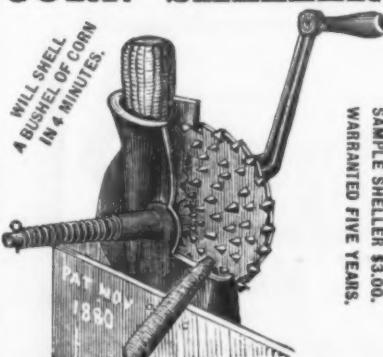


For price lists
and discounts
Address



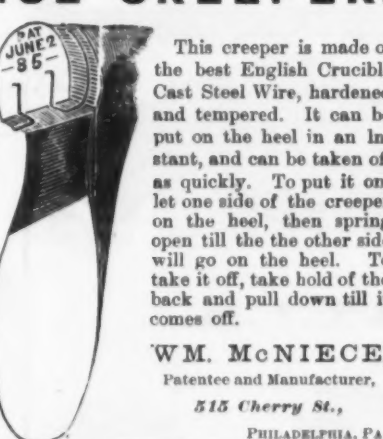
CHAS. MORRILL,
64 College Place,
NEW YORK.

50,000 IN USE. WOOD'S FAMOUS CORN SHELLER.



BEST SHELLER IN THE WORLD!
Ask your merchant for it. Agents wanted. Address
GARRY IRON ROOFING CO.,
Sole Manufacturers and Owners,
CLEVELAND, O.
For Circulars, and Price-List No. 60.

McNIECE'S ICE CREEPER.



This creeper is made of the best English Crucible Cast Steel Wire, hardened and tempered. It can be put on the heel in an instant, and can be taken off as quickly. To put it on, let one side of the creeper on the heel, then spring open till the other side will go on the heel. To take it off, take hold of the back and pull down till it comes off.

WM. McNIECE,
Patentee and Manufacturer,
515 Cherry St.,
PHILADELPHIA, PA.

CHAMPION IRON FENCE CO., KENTON, OHIO.

Largest Iron Fence and Railing Works in U. S.



SPECIALTIES—Iron Stairs and Jail Work, Builders' and Ornamental Iron Work, and the only manufacturers of Malleable Iron Casting, guaranteed against breakage; also manufacturers of the Celebrated Ohio Champion Iron Force and Lift Pumps. Send for 10-page Catalogue.

MONCE'S
NOVELTY GLASS CUTTERS are the Standard.
All Salable Styles made.
Remember that we are the Originator of the Glass Cutter Wheel—Patents not yet expired—INTERCHANGEABLE LOCK STENCILS.

S. G. Monce, Mfr., Bristol, Conn.

PATENTS
AND PATENT SUITS.
Please send for Circular to
THOMAS D. STETSON,
28 Murray St., New York

Self-Binders for The Iron Age.



We are now prepared to supply our subscribers with an excellent self-binder for their papers, a cut of which is annexed. We call attention to the low prices at which it is offered. Address all orders to
DAVID WILLIAMS,
66 and 68 Duane Street, New York.

Wm. Rogers' German Silver and Plated Spoons and Forks. Send to **SIMPSON, HALL, MILLER & CO.** Wallingford, Conn., for Illustrated Catalogues. Branch Houses: 36 East 14th St., New York; 624 Commerce St., Phila.; 116 State St., Chicago, Ill.



J. STEVENS ARMS AND TOOL CO.
P. O. BOX 315,
Chicopee Falls, Mass.

MANUFACTURERS OF

Spring Calipers
—AND—
DIVIDERS.



THE F. F. ADAMS CO., ERIE, PA.,

MANUFACTURERS OF
Rat and Mouse Traps, Clothes Wringers, Step and Extension Ladders, Clothes Bars, Steam Flue Cleaners, Cork Pullers.
SEND FOR CATALOGUE.



BIRMINGHAM PLANE MFG. CO.,
BIRMINGHAM, CONN.,



W. H. JACOBUS & CO.,
HARDWARE MANUFACTURERS' AGENTS,
No. 90 Chambers Street, New York.

AGENTS FOR
The Morris Sash Lock Mfg. Co., The Ireland Mfg. Co., Lorenz Bommer, Penn Lock Works,
Dibble Mfg. Co., Thurston Mfg. Co., Zimmerman's Blind Adjusters,
Keystone Screw Co., J. F. Wollensack, Tuck Mfg. Co.

AMERICAN IRON AND STEEL WORKS.

JONES & LAUGHLINS, Limited,
Lake and Canal Streets, Chicago,

MANUFACTURERS OF

STEEL NAILS,
MERCHANT BAR, BAND, HOOP and SHEET IRON,
Chains, Spikes, Bolts, Rivets,
BESSEMER STEEL,
BEAMS, CHANNELS, ANGLES, TEES, PLATES, &c.;
COLD ROLLED SHAF'TING.

WORKS AT PITTSBURGH, PA.

SOLID EMERY WHEELS
—AND—
GRINDING MACHINES.



Owing to our non-employment of traveling salesmen, many manufacturers, especially in the over-drummed territory of New England and New York, have been led to overlook the sterling merit and standard reputation of Tanite Emery Wheels and to accept inferior substitutes. We earnestly solicit correspondence with all users of such goods. We will gladly send them our illustrated catalogue and discounts when character and quantity of goods are specified. Stroudsburg being only about three hours by rail from New York City, our goods can be delivered cheaply and quickly, and we carry stock in the hands of over 50 agents in the various cities of the United States.

THE TANITE COMPANY,
STROUDSBURG, MONROE COUNTY, PA.
Established 1867.



BRANCH HOUSES. { NEW YORK.
CHICAGO.

St. Louis Stamping Co.,

ST. LOUIS, MO.,
MANUFACTURERS

GRANITE IRONWARE

AND DRIPPING PANS,

Fine Black Sheet and Galvanized Iron.

SEYMOUR MANUFACTURING CO.'S
Celebrated CRASS SNATHS

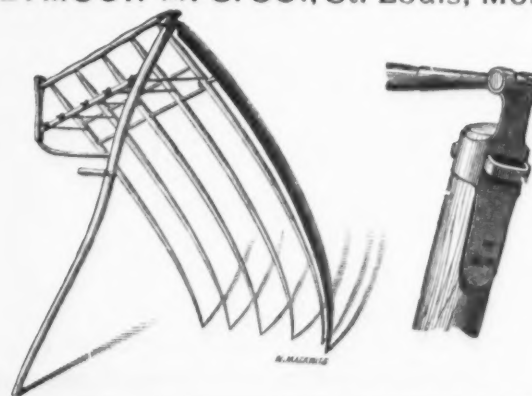
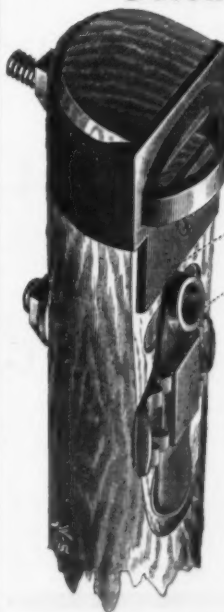
WITH ADJUSTABLE FASTENING.

ALSO THEIR PATENT
CREEDMOOR GRAIN CRADLES,
TO WHICH ANY SYTHE MAY BE ATTACHED.

The Best Grain Cradle Ever Manufactured.

Send for Catalogue and Prices.

SEYMOUR MFG. CO., St. Louis, Mo.



THE
Bristol Patent Truck

Simple—Durable—Labor-Saving.

This Truck is adapted to handling all kinds of packages, barrels, boxes, &c., &c.

FOR FACTORY USE IT IS UNEQUALLED.

DEMING MACHINE CO.
Gentlemen.—The four Handy Trucks of your make which we have in use give excellent satisfaction. On a smooth floor a man can move a half-ton cask of wire on one of them with one hand.
Yours truly,
WATERBURY BRASS CO.
WATERBURY, CONN.

Send for Circular and Prices.

F. DEMING,
MANUFACTURERS,
Waterbury, Conn.

Also maker of Iron Draw Benches for Brass and Copper Tubing, Power Presses, Special Attachments, Spinning Lathes, Slitting Machines and Rivet Machines.



FRUIT WINE & JELLY PRESS

SAUSAGE STUFFER

MOLASSES SELF MEASURING FAUCET

ENTERPRISE MFG. CO.
THIRD & DAUPHIN STS. PHILADELPHIA

Mrs. Potts' COLD HANDLE SADD IRONS
SOLD BY ALL HARDWARE DEALERS
SEND FOR ILLUSTRATED CATALOGUE

SMOKED BEEF SHAVES

MEAT CHOPPER

BUNG HOLE BORER TOBACCO & ROOT CUTTER

SELF WEIGHING CHEESE KNIFE

AWARDED FIRST PREMIUM

NO. 20 COFFEE MILL

Twenty different sizes from \$2.75 to \$100

THE "BUCKEYE" JUNIOR LAWN MOWER

MANUFACTURED BY **MAST TOOLS & CO.** SPRINGFIELD, O.

The Lightest Running,
Most Durable and
Far Surpassing all
other Machines made
10, 12, 14 and 16 inch cut.

ALSO MANUFACTURERS OF THE
**Buckeye Hose Reel and Lawn
Sprinkler, Buckeye Wrought
Iron Fencing, Buckeye
Force Pump,**
—AND—
Iron Turbine Wind Engines

SEND FOR CIRCULAR AND PRICE LIST.

The Scranton Heavy Hangers

FOR
**Warehouses, Car Barns,
Freight Depots, Mills,
Factories,**
and wherever Large or Heavy Doors are used.

These Hangers are absolutely without competition in strength, style and price. Samples sent to the Trade for inspection and exhibition, and special prices quoted on application.

Scranton Mfg. Co.,
68 to 74 W. Monroe St., CHICAGO.

North Wayne Tool Co.,
HALLOWELL, MAINE.

W.H. CARTER'S PATENT NEEDLE HAY KNIFE.
PAT. APR. 29, 1884.
IMPROVED BY M.M. BARTLETT.
Improvement Patented April 29, 1885.

NEEDLE HAY KNIFE, THE BEST IN THE WORLD.

Improvement patented April 28, 1885, of which we are the sole manufacturers, has been tested with the most celebrated knives of other makers, and has proved an easier and faster cutter than any other. Its special excellence consists in the chisel-edge tooth shown in the engraving. It may be used for cutting hay in the mow, stack and bale; also for ditching, cutting peat, or any other work for which a hay knife is used. It can be readily ground by the most inexperienced, as it requires to be ground only on one side. Should a tooth break, all that is necessary to replace the damage is to grind it once and a new chisel-tooth appears. It can ordinarily be sharpened with a common scythe stone. Try one and you will give it the preference.

THE SWIFT MILL.
ESTABLISHED 1845.

The annexed cut shows one of the many styles of Coffee Mills of our manufacture, especially adapted to Grocers' use and all retailers of coffee. They are highly ornamental, and workmanship of the very best. We make more than 30 styles.

ALSO, LANE'S PORTABLE COFFEE ROASTER.
Will roast 30 to 40 lbs. at once, and can be used as a stove at other times. Send for descriptive list to Manufacturers.

LANE BROS., Poughkeepsie, N. Y.
Also Sold by Leading Wholesale Houses.

Our agents, John H. Graham & Co., 113 Chambers St., New York carry a full line of our goods, and will be pleased to serve you at factory prices.

**B. KREISCHER & SONS,
FIRE BRICK.**
BEST AND CHEAPEST.
ESTABLISHED 1845.
Office, foot of Houston Street, East River, NEW YORK.

**NEWTON & CO.,
ALBANY, N. Y.,
MANUFACTURERS OF BEST QUALITY**

**FIRE BRICK
And STOVE LININGS.**

**M. D. VALENTINE & BRO.,
MANUFACTURERS OF**

**FIRE BRICK
And FURNACE BLOCKS.**

**DRAIN PIPE AND LAND TILE,
Woodbridge, N. J.**

**BORGNER & O'BRIEN,
MANUFACTURERS**

**FIRE BRICK
AND**

**Edge Pressed Furnace Blocks,
Clay Retorts, Tiles, &c.
Twenty-third Street, Above Race, PHILADELPHIA.
Twenty years' practical experience.**

ESTABLISHED 1845.
**TROY FIRE BRICK WORKS,
Troy, N. Y.**
**James Ostrander & Son,
MANUFACTURERS OF
FIRE BRICK,**
Tiles, Blast Furnace Blocks, &c., and in a Special
Department Linings for Stoves, Ranges and Boilers of
superior quality. Miners of and dealers in Wood-
bridge, N. J., Fire Clay and Fire Sand and Staten
Island Kaolin.

ESTABLISHED 1864.
**JAMES GARDNER,
Successor to GARDNER BROS.,
MANUFACTURER OF**

**"STANDARD SAVAGE" FIRE BRICK,
TILE & FURNACE BLOCKS,
OF ALL SHAPES AND SIZES**
Miner and Shipper of "Mount Savage" Fire Clay.
WORKS, Ellerslie, Allegheny Co., Md.
MAIN OFFICE, Cumberland, Md., P. O. Box 93.
BRANCH OFFICE, Pittsburgh, Pa., P. O. Box 373.
S. H. Hamilton & Co., Agents, Baltimore, Md.

**UNION MINING COMPANY.
MOUNT SAVAGE FIRE BRICK.**
Agent for Eastern Penna., West New Jersey and Delaware,
EDWARD J. ETTING,
222 South Third St., Philadelphia, Pa.

BIRMINGHAM FIRE BRICK WORKS.
All dimensions of Firebricks and Shapes,
Fire Clay for Furnaces, Coke Ovens, Boil-
ers and Patent Grate Linings. Drain Tile,
Street Paving Blocks and Fire-Proof Hol-
low Bricks for Buildings.
BIRMINGHAM, ALA.

THE NEW EASY LAWN MOWER.
The leading mower in the
market.
Front Cut, Steel, Open
Roller Traction. Easy
and Noiseless in
Operation

The only mower that will
cut Wet Grass, Narrow
Borders, and close to walls
and fences. Warranted in
every particular.

Manufactured by
BLAIR MFG. CO.,
Springfield, Mass.

Medium Size "NEW EASY."

**LAWN MOWER
The New Model**
Our Latest & Best
MOWER.

For Simplicity, durability, and quality of work. It is unequalled while for lightness of draft it excels by a large per centage, any other Lawn Mower made.

**CHADBORN & COLDWELL
MANUF'G CO.**
NEWBURGH, N. Y.

METAL AND RUBBER STAMPS,
steel figures and letters,
name stamps, type for type
writers, chased-iron figures
and letters, stamps for rais-
ing letters on wood or
metal, branding irons, pat-
tern letters, stencils, home
rubber type, rubber stamps, &c. Send for free illus-
trated catalogue.

BELLOWS & DICKEY, 39 to 43 Viaduct St., Cleveland O.

Plow Colters, Blades and Fubs.
Adjustable, Caster, Stationary.
All Kinds and Sizes.

GEO. K. OYLER MFG. CO.,
ST. LOUIS, MO., U. S. A.

WRITE FOR CATALOGUE.

HP NAIL CO., CLEVELAND, O.
MANUFACTURERS OF
STANDARD PENNY NAILS.
BRADS OR FINISHING NAILS. CAR NAILS. CIGAR BOX NAILS. TIN AND SLATE
ROOFING NAILS. WIRE SPIKES FOR TRACK AND DOCK WORK. WIRE TACKS.
BLIND AND BED STAPLES AND LINKS. MCGREGOR NAIL BOXES, AND
WIRE NAILS OF ALL KINDS, BARBED OR SMOOTH,
PLAIN, TINNED OR GALVANIZED.

AGENTS:
J. C. McCARTY & CO., New York. I. WALES & CO., Boston. HEATON & DENCKLA HARDWARE CO., Philadelphia.
HIBBARD, SPENCER BARTLETT & CO., Chicago. BEALS & BROWN, Buffalo. C. B. MELISH, Cincinnati, Ohio
HUNTINGTON, HOPKINS & CO., San Francisco. JNO. PRITZLAFF HARDWARE CO., Milwaukee.

Chaplin's Patent Iron Planes.



JACKS AND JOINTERS.
These Planes (with a smooth face) have been in the market for many years, obtaining a steadily increasing trade as they have become known. We claim for them the utmost simplicity of construction, prompt adjustment and superior beauty of style and finish.

The clamp plate and lever are nickel-plated; the handle is of checkered rubber, which is stronger than any wood handle, and affords an easy, firm grip; also made with nicked iron handle, which lists 25 cents less on each number.

SMOOTH PLANE.
CORRUGATED BOTTOM.

This Cut shows the surface of our new Corrugated Iron Planes. The corrugations afford ample air space, and reduce the traction and friction to the minimum. Same price as smooth face.

CORRUGATED FACE. SMOOTH FACE.

No. 202, Iron Smooth Plane, 7x1 1/2 in. Cutter.....	\$3.00
No. 203, Iron Smooth Plane, 8x1 1/2 in. Cutter.....	3.25
No. 204, Iron Smooth Plane, 9x1 1/2 in. Cutter.....	3.50
No. 205, Iron Smooth Plane, 10x1 1/2 in. Cutter.....	3.75
No. 206, Iron Jack Plane, 12x2.....	3.85
No. 207, Iron Jack Plane, 12x2 1/2.....	4.05
No. 208, Iron Fore Plane, 18x2 1/2.....	5.00
No. 210, Iron Jointer Plane, 24x2 1/2.....	5.75
No. 211, Iron Jointer Plane, 24x2 1/2.....	6.75

With Adjustable Throat.

No. 233, Iron Smooth Plane, 8x1 1/2.....	\$3.50
No. 235, Iron Smooth Plane, 9x2.....	3.75

All of these Planes are Nickel-plated finish.
This Adjustable Mouth Smooth Plane is a new feature, and meets with a great deal of favor.

No. 20, Block Plane, Japanned, 6 1/2 x 1 1/2 in. Cutter.....	\$1.40
No. 30, Block Plane, Nickel-plated, 6 1/2 x 1 1/2 in. Cutter.....	1.65

Both with Adjustable Throat.

THE FOLLOWING JOBBERS CARRY A GOOD ASSORTMENT

RIGEL & DOWSE, Boston.
HENRY BROOKS & CO., Boston.
WALBRIDGE & CO., Buffalo.
JOSEPH WOODWELL & CO., Pittsburgh.
KRUSE & BAHLMANN, Cincinnati.
A. F. SHAPLEIGH & CANTWELL, HDW. CO., St. Louis.
WITTE HDW. CO., St. Louis.
EDWIN HUNT'S SONS, Chicago.
BUHL, SONS & CO., Detroit.
WM. FRANKFURTH HDW CO., Milwaukee.

FARWELL, OZMUN & JACKSON, St. Paul.
JANNEY, SEMPLE & CO., Minneapolis.
MILLER BROS. & FLETCHER, Minneapolis.
BLISH, MIZE & SILLIMAN, Atchison.
PARK, CRANER & CO., Leavenworth.
ROGERS & BALDWIN HDW. CO., Springfield, Mo.
FROTHINGHAM & WORKMAN, Montreal, Can.
CAVERHILL, LEARMONT & CO., Montreal, Can.
WM. THOMSON & CO., Toronto, Can.
WOOD & LEGGAT, Hamilton, Can.

TOWER & LYON, Manufacturers, 95 Chambers St., New York.

THE UNIVERSAL SHUTTER WORKER.

A strong, simple and durable fixture for opening and closing outside Blinds and Shutters from within the house without raising windows or removing window screens.

BUTLER HARDWARE CO.,
18 Warren St., New York.

INSIDE ELEVATION

OUTSIDE ELEVATION

**BRIGHT IRON AND BRASS
WIRE GOODS.**

Also Bright Wire Goods for Cotton and Woolen Mills. Wire straightened, cut, milled and bent into any shape, with or without thread. Write for Catalogue and Prices.

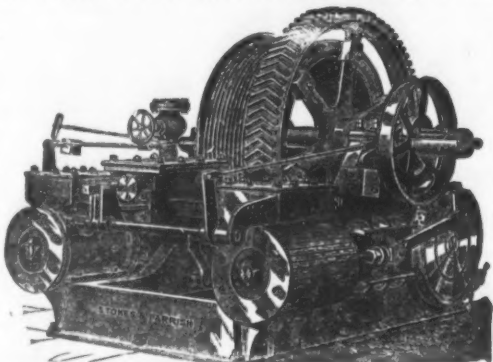
M. S. BROOKS, Chester, Conn.

**GEO. M. SCOTT,
Bellows Manufacturer,**
Johnson Street
Cor. 22d St.,
CHICAGO, ILL.

STOKES & PARRISH MACHINE CO., Philadelphia.

ELEVATORS,

Passenger and
Freight, Steam,
Hydraulic and
Belt Power.

HOISTING
MACHINERY

For Mines, Dock
Use and Inclined
Planes.
All kinds of
Hoisting Machin-
ery a Specialty.

BLAST FURNACE HOISTING ENGINES,

With Vertical or Horizontal Cylinders for Handling Stock to Top of Stack
with One or Two Platforms.

Works and Office, 3001 CHESTNUT STREET, PHILA.

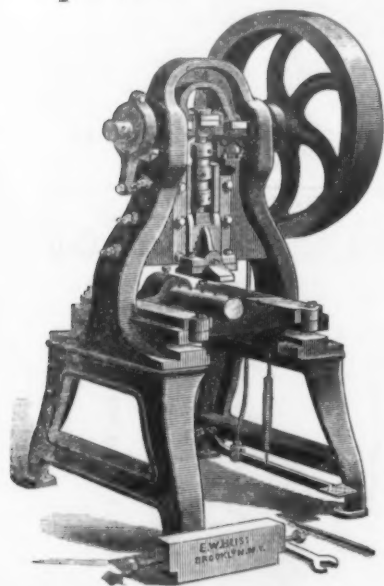
New York Office, 95 and 97 LIBERTY STREET.

E. W. BLISS CO.,

MANUFACTURERS OF

Presses and Dies and Special Machinery

For Working all Shapes and Classes
of Sheet Metal.

DOUBLE
SEAMING MACHINES

FOR
Round, Square and Oval Cans.

HAND AND POWER

Circular Shears.

Foot and Power
Squaring Shears.

WORKS
Plymouth, Pearl and John Streets,
BROOKLYN, N. Y.

OFFICE
17 Adams Street,
BROOKLYN, N. Y.



ALSO, MALLEABLE IRON AWMING FRAME FITTINGS.

SEND FOR PRICE LIST TO
PANCOAST & MAULE Philadelphia, Pa.

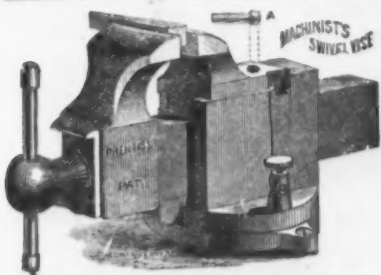
MALLEABLE IRON, PIPE RAILING FITTINGS,
FOR FENCES, ENCLOSING ENGINES AND MACHINERY, EXHIBITION STAGES,
FINE ESCAPES, STAIR HAND RAILS, ETC.

IMPROVED
Steam Glue Heaters,

For Pattern Makers, Cabinet Makers, Joiners,
Bookbinders, Car Builders, &c. Has no
Joints to leak, and is furnished with
Enamelled Iron Pots which
will not discolor Glue
or Paste.

For Price-List of fifteen different sizes, address

PANCOAST & MAULE,
PHILADELPHIA.

PRENTISS' PATENT VISES,
ADJUSTABLE JAW.

Stationary or Pat. Swivel Bottoms,
Adapted to all Kinds of Vise Work, also

"PEELLESS" SWIVEL PIPE GRIP,
FITS ANY VISE. SOLD BY THE TRADE.

PRENTISS VISE CO.,
23 Day St., New York,

SOLE PROPRIETORS. SEND FOR CIRCULAR.

BUTTERFIELD & CO., MANUFACTURERS, DERBY LINE, VT.



FERRACUTE MACHINE CO.,

BRIDGETON, NEW JERSEY, U. S. A.

Presses, Dies AND ALL OTHER Sheet Metal Tools.

Send for Illustrated Catalogue with sizes, weights and prices
of 100 different kinds of Presses and Tools for

Cans, Tinware, Silver and Brass Goods, Locks, Hardware
and other Iron Goods. A new line of Punching Presses just out.

AMERICAN BOLT COMPANY,

Manufacturers of

BOLTS AND NUTS, COACH OR LAG SCREWS

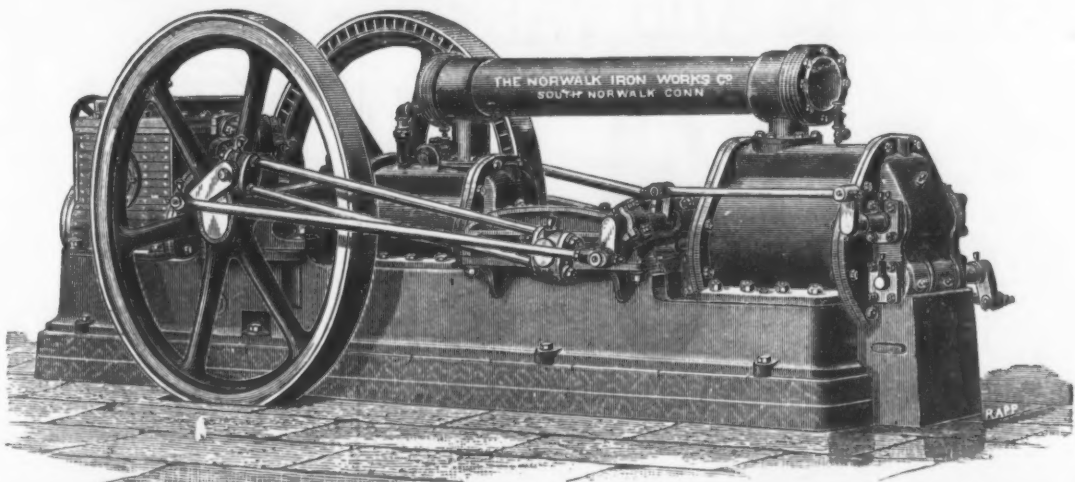
Bridge Bolts, Car Bolts, Track Bolts, Washers, Chain Links, BUILDING BOLTS
AND IRONS OF ALL KINDS, Forgings, Bolt and Nut Machinery, &c.

JAMES MINTER, President,

LOWELL, MASS.

MILES F. BRENNAN, Treasurer,

Air Compressors.



THE NORWALK IRON WORKS CO., South Norwalk, Conn.

THE STANDARD TOOL CO.,

CLEVELAND, OHIO,

Manufacturers of

INCREASE TWIST DRILLS, &c.,
TAPER SHANK DRILLS,
Straight Shank Drills
Machine Bit Drills,
Screw Driver Bits,
BIT STOCK
Drills,

SOCKETS,
Hand and
Shell Reamers,
Standard Gauges, Milling
Cutters and Special Tools,
Morse Taper Reamers,
Standard Patent —

TWIST DRILL GRINDING MACHINE.

New York Office, 33 Chambers Street.

Established in 1874. 24 and 26 West Street, Cleveland, O.
Cleveland Twist Drill Co., 101 Chambers Street, New York.
SEELEY, CHURCH & CO., 315 California St., San Francisco. 85 Queen Victoria St., London, Eng.

Ludlow Valve Mfg. Co.,
OFFICE AND WORKS:
938 to 954 River St. & 67 to 83 Vail Ave., Troy, N. Y.
VALVES.
Double and Single Gate, 1/4 in. to 48 in.—outside and inside Screws, Indicator, &c.
for Gas, Water, Steam and Oil. Yard and Wash Hydrants. Send for Circular. Also
FIRE HYDRANTS.

Morse Twist Drill & Machine Co., NEW BEDFORD,
MASS.,
Manufacturers of Morse Pat. Straight-Lip Increase Twist Drills,

Bit Stock Drills, Solid and Shell Reamers, Drill Grinding Machines,
Milling Cutters,
Beach's Patent Self-Centering Chucks, and Special Tools to Order.

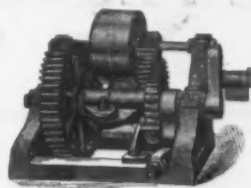
ALL TOOLS EXACT TO WHITWORTH STANDARD GAUGES.

MANNING, MAXWELL & MOORE,

Sole Sales Agents for THE MORSE TWIST DRILL AND MACHINE CO.'S

Manufacture of Patent Machine Relieved Nut, Hand,
Blacksmith and Machine Screw Taps, Screw Plates, Tap
Wrenches and Patent Relieved Pipe Taps and
Pipe Reamers; also of Solid Bolt and Pipe Dies.
Furnished in V, U, S. Standard and Whitworth
shape of threads.

111 Liberty Street, NEW YORK.



Peck Lifter.

PECK'S PAT. DROP PRESS
BLAST-FORGES
STEEL AND IRON DROP FORGINGS.
Drop Dies and Special Machinery.
BEECHER & PECK, NEW HAVEN CONN.

NEW PROCESS TWIST DRILL CO.,
Hot Forged Straight Lip Increase Twist Drills

Drills of any size or length, with Straight or Taper Shanks, made to order and to fit any socket desired.
SEND FOR CATALOGUE AND PRICE LIST.
TAUNTON, MASS.

CURREN & BAGG, 106 Chambers St., New York, Sole Agents for New York and Vicinity.

RIVAL
STEAM PUMPS
THE CHEAPEST
AND THE
BEST
FOR
HOT & COLD
WATER.
\$35.00
UPWARDS.
SEND FOR
CIRCULAR

RELIANCE HYDRAULIC JACKS,

MADE IN FOUR SIZES,
15, 20 and 30-ton capacity, to lift 15 or 18
inches. Broad Base or Ground Lf.

DIEBELT & EISENHARDT
Makers,
1308 Howard Street, Philadelphia.

A. H. MERRIMAN,
MERRIDEN, CONN.,
Manufacturers of all Descriptions of
PRESSES.
Catalogue and prices sent on application.

WORKSHOPS

WITHOUT
STEAM POWER
SHOULD HAVE
BARNES'

Patent Foot Power Machinery. COMPLETE
Outfits for actual workshop business.
With them Builders, Cabinet
Makers, Metal and Wood Work-
ers compete with steam power.
Machines on trial if desired.
Proof of value, prices, full
detail, illustrated catalogue, free.
W.F. & John Barnes Co.,
Rockford, Ill.
Address No. 69 Ruby St.
Dealers send for discount sheet.

E. E. GARVIN & CO.

Manufacturers of Machinists' and Iron Workers' Tools, Lathes, Planers, Milling Machines and Drills

Special Tools for all kinds of manufacturing to order.
We received Gold Medal for our
NEW UNIVERSAL MILLER
at N. O. Exposition. (See cut.)

Gear and Rack Cutting, Milling and
Index Drilling to Order.

139 to 143 Centre St., New York,

